YES, YOU CAN!

Aaron Powell, M. Eng.

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1. Introduction

This book is born out of my many-years experience on multidisciplinary projects in software development of biotechnology, financial, energy, and acoustics applications. I graduated with Masters of Engineering degree in the field of Electrical Engineering – Power, and by applying my method of Premise Based Implicative Truth Synthesis I have successfully broadened my expertise in many diverse fields, landing contracts in virtually any industry I wanted, regardless of how the software development market fared.

With this book I want to give you a new, unique perspective and knowledge I have gained, so, YES, YOU CAN too make significant progress in your career and your life.

Let's start!

Have you ever realized or acknowledged that the answers to some of the questions, say from your education or professional training, have nowhere to expand; there is no link to connect them to the next discipline, to adventure beyond your expertise horizon? And, although you acquired a new knowledge, you sensed that it actually limits your ambitions and aspirations?

My Premise Based Implicative Truth Synthesis method will show you how to make novel connections

between unusual ideas, how to learn new things in an original way, and moreover, put the gained knowledge in functional relationships with the discovered dependent disciplines. Your self-esteem will sky rocket. Your social status will make a turn to the better.

The method will also answer the most pressing questions you have about success, education, professional development, or business, and, for that matter, about many aspects of your life. It will build up your motivation by reinforcing and, sometimes, transforming, your personal beliefs about your highest values and about the world around you. When Premise Based Implicative Truth Synthesis delivers to you a strong personal philosophy it will be very hard to give up on any goal.

Over time, I did ask myself some tough questions. What to study? How to gain marketable expert knowledge? Can I improve my memory? Can I find a universal reasoning mechanism to tackle almost any technical or creative challenge? You will find some surprising answers to these questions in the following chapters.

During my university years I remember waking up in the middle of the night thinking, “Is this the real knowledge, measured by grades in schools? Where is the originality? Where is the freedom of thought that should lead to success in the field of your choice?”. I was good in mathematics and physics. But, that was not enough for

me, and I did not like the application of it in power engineering. I loved power engineering but, I strongly felt that here must be something more than rotating shafts of generators! Something that can unify mathematical knowledge, science, our human experience, and art. The answer for this was Premise Based implicative Truth Synthesis. And I know for a fact what skills I wanted – software development and computer engineering. To me, this field was a crown of synergy between technology and humanities. And I was proven right.

Transition from power engineering to software development was relatively smooth. When I switched jobs from the factory of high voltage insulators to the software development, it was like dreams come true. It offered an unbounded possibilities for one's progress. While it was fun and challenging from the beginning and did not disappoint (creativity wise) I knew the battle just begun.

Software industry competition was unique. New software libraries from different vendors led by Microsoft were popping every year, and therefore the market was looking for flexible developers who can easily absorb new definitions and tools in record time and be a productive member of, usually, multi-disciplinary teams. Other industries were revolving and evolving about software, object-oriented programming, artificial intelligence, and humanities. Of course, big (but not the only) motivation

was a six-figure salary and lucrative contract rates. While the competition was fierce, for me it was quite manageable and I didn't complain. Discipline, efficiency, and confidence was my answer to these challenges.

I was learning a lot on the job. However, the way how I learned evolved over time, resulting in my original Implicative Truth Synthesis method. Surviving in computer industry was my priority and shining in it was my goal. And within just a few years I reached six-figure salary which was one of my targets. Acquiring new knowledge, in any field, was my second nature. The field can be mathematics, engineering, biotechnology, or finance, to name a few. From this knowledge I was able to generate creative, effective and original solutions for the projects I was engaged with. So, the Implicative Truth Synthesis helped me in two crucial aspects – to effectively acquire new knowledge (in record time and deep understanding) and to form original solutions often combining two or more fields.

You will find quickly enough the meaning behind the words Implicative Truth Synthesis. Only few technicalities will be needed to be explained and after that off you go – sailing on your own. Perhaps, the first time in your history you will become aware of your mind as your own, powerful tool, flexible and capable to tackle any imaginable problem or task.

Your intellect commands an outstanding potential for success and the most promising drive to propel you from the current state of affairs to an action packed path towards your goals. How it might be, as I learned, is more powerful than how it is. With Implicative Truth Synthesis YOU CAN *turn on* your creative, mighty intellectual engine, which you may not even know it existed.

Creativity! One of its sources lies in the ability to recognize many kinds of innovations in the world around you – from the carefully chosen words of a poem to groundbreaking technology advancement; from an empowering motivational speech to the rocket science's endeavour which makes seemingly impossible things possible. Creativity and innovation already shape the world around you and by recognizing where innovation played role, you *increase the chances* of your own successful innovative thinking.

With Implicative Truth Synthesis you will also become more judicious about what to accept as your goals of value. When you determine your goals' values level of importance and measure of quality, you will respect more your time and when and where you invest significant amounts of energy and efforts towards those goals.

There may be hits and misses, as in many endeavours. But, each, so called, "failure", draws a short, wiggled line which is a detail of a special contour

representing the bigger picture. That bigger picture, outlined after a number of, so called, “failures”, will reveal the things you are good at. Its shape will uncover your real passions and point to you where to focus further on. This contour will heighten the reasons for you to keep trying, to complete that bigger picture with all of its parts, and, therefore, see your strengths and goals in a fresh perspective and with crystal clarity.

You might ask yourself what are the alternatives to Implicative Truth Synthesis for reasoning, gaining knowledge, and being visionary.

One pattern to look at is how most of us approach education. Passing exams, in many cases, proves nothing about our creativity, original thinking, or a potential for entrepreneurship. Moreover, we can pass exams, get certifications, by, essentially, learning things by heart, while missing to understand the broader picture. Later we may even forget what we have learned. In addition, market can move in unexpected directions driven by technological advances and human factors in global and local economies. This can render our narrow field of specialization more or less irrelevant. It matters what and, more importantly, how we learn. Absorbing knowledge by school-defined “learning”, as it is well-liked in educational systems, more often than not, alienates us from critical thinking. We are often required to just spell out what has

been discovered (within the subject under study) instead of finding out how something has been discovered. Education usually favours reciting huge number of facts, without bringing to light the spectrum of their significance or broad cross-discipline relationships, thus hampering the development of our innate reasoning powers and reducing your flexibility to respond to job market challenges.

Premise Based Implicative Truth Synthesis approach eliminates many of these disadvantageous points. With my approach you will not just acquire the knowledge, but morph it to serve your desires and goals. And, as far as the education is concerned, with this method, you will clearly recognize axiomatic boundaries within the subject matter, appreciate the innovative thinking leading to the results you are studying, and determine outward opening points so you can see where your subject matter, under study, further applies and how. You will actively search the subject matter's influence on the human, social domain, hence greatly increasing your chances for success. When learning new material, progress assessment should not be dictated by textbook questions only. More importantly, it should be measured how close you are getting to your goals with the learned subject. And that, in fact, should be your primary criterion. You will also become aware that the discipline under study has to be positioned in the social sphere of relationships

and influence, because your long term goal advances beyond passing exams. You goal focuses on *success*, and success, by its big part, belongs to the social "game." With Implicative Truth Synthesis, you will take advantage of enormous collection of knowledge available on the internet, so you will depend less and less on old fashioned courses. You will be able to search and collect the best lectures, available free on the internet that interests you and contribute to your goals. Guided by Implicative Truth Synthesis you will be able to single out the best parts of online lectures, research papers, and books – parts that will answer your own questions about the subject and about your goals.

Premise Based Implicative Truth Synthesis gives you an effective method to achieve goals in, for instance:

- Architecture
- Health
- Nutrition
- Human behaviour
- Finance
- Economics
- Engineering
- Computer technology

and, most importantly, in your specific profession.

Also, as I mentioned, you will be highly motivated to do the work on your projects because, with Premise Based Implicative Truth Synthesis, you own the best ideas-penetrating analytical tool to achieve any goal, and that truth alone will boost your motivation and completely disqualify fear from your reasoning.

With Implicative Truth Synthesis there is no “end-of-the-rope” situation, there is no "this-street-has-no-exit" direction when you don't know what to do next. The new *implicative link* always exists, pointing to a potential new solution via Implicative Truth Synthesis.

Implicative Truth Synthesis actively redefines the meaning of learning, knowledge, skill, and expertise. Implicative Truth Synthesis is a cognitive Jiu-Jitsu.

From Kafka to Fourier Transform, you will explore unexpected creative links between math, neuroscience, literature.

For example, if you apply Premise Based Implicative Truth Synthesis - after you go through this book – to a corporate job you might hold right now, you will learn:

- where are the tasks for you coming from
- how to clearly see which quality and performance levels your position requires
- how to effectively talk to your managers

- how to write the best possible resume
- how to add value to the company
- how to approach the boss about your raise
- how to prepare for an interview
- how to find premises and apply Implicative Truth Synthesis for your boss's projects,
- hence dramatically improving your job performance.

By applying Implicative Truth Synthesis as a team member, you will understand which premises and axioms define your part of the project or of the processes. This insight will make you incredibly reliable - a desired team member quality. When you detect premises change in your part of the project you will be able to adapt quickly and easily. Your will show unwavering commitment to the project goals because you will have the unique knowledge, established by Implicative Truth Synthesis, of the team work's dynamics - you will love the vision of success in front of you.

By applying Implicative Truth Synthesis as an organization or a team leader you will clearly see how the different parts of venture correlate with each other and what defines the roles of your team members or departments. As a leader, being able to understand and

segregate the endeavour along the axiomatic boundaries within your organization, you will beam a sincere enthusiasm and passion about the organization's vision; and it will be contiguous - everyone likes to work with optimism-energized leader.

Once you have your day job under control you can, perhaps, explore your entrepreneur talents! And the method is not limited to these aspirations only! The next chapter gives you illustrative examples from car racing, artistic painting, and physics and then focus shifts to the applications of Implicative Truth Synthesis in engineering, architecture, music, and more. You will also learn few important things about language as a medium for knowledge transfer. Language can be an effective way to describe things. Grammar is a nice infrastructure to convey a message, and reference system used by language usually fulfills its role in the knowledge transfer. But language can hide the real nature of the relationships it describes and can mask what kind of intelligence you have in order to understand the topic. With Implicative Truth Synthesis you will discover how do we understand what we read – and discover relationships between concepts by unwrapping language based descriptions.

With this in mind you will explore what kind of intelligence you have by venturing on the other side of language. You will be able to form a bridge between the

language of your choice and the targeted kind of intelligence with the Implicative Truth Synthesis method.

My book is as much a technical guide for your mind (and my mind, at the first place!) as is a motivational source. I trust that my book will find place on your coffee table, easy on the eyes, and as an enthusiastic reminder that, YES, YOU CAN! I hope it will be within your reach and can be in your hand any time you want to reinforce motivation and have a guide for your next thought and action.

2. What is Premise Based Implicative Truth Synthesis?

Success can be defined as a social game of one's personal drive and interpersonal influence.

In addition to the inclusion of a social aspect in our initiatives, success is also made of one essential ingredient - creativity. Creativity can be defined as a capability, power to connect seemingly unrelated fields, systems, and ideas, into a new whole with a novel meaning and functionality.

It might be interesting to explore, for instance, is there a way to associate our behaviours, what we value, what matters to us, with such diverse fields as mathematics, engineering, biochemistry? And, if we can discover that connection, is there a method to find and spark our own creative and intellectual powers to achieve our goals based on what we have learned from those relationships?

Premise Based Implicative Truth Synthesis answers these questions.

While the method's concept may appear complex at first, I will demonstrate how you can effectively grasp its meaning by gradually introducing its leading ideas.

Let's begin!

For instance, how can you connect the world of mathematics and the world of physics?

Choosing starting numbers and the initial sequence of operations on them, represents the only entry to the mathematical world, from any field, not only from physics. Once this is accomplished you can continue towards obtaining problem specific results in mathematics.

The physical relations between observed physical objects, for example their motion and speed, are quantifiable. It means that these relations can generate numbers, supply numbers as entry points, to mathematics. This action of postulating numbers is the actual connection point between physics and mathematics. Only through the postulate from the one system to another, two different systems can be functionally linked. Hence, in physics, generally non-mathematical events (but quantifiable), like motion, rotation, acceleration, postulate numbers as a-priori inputs (no question asked how they have been obtained) to the mathematical world. Then, inner actions within mathematics, logic being a major player, accept this spectrum of initial values, do the “processing” on them to obtain the relevant mathematical results, and return those result back to the world of physics.

Is it possible to detect if any two systems, that might be, on the first sight, very different, can be "connected" in the sense described? The answer follows.

To apply the Implicative Truth Synthesis approach you expect that the systems function on, and are based

on, the logical principles. The creativity lies in the important fact that there must be a set of initial conditions, axioms, or premises that describe the system or serve as the starting points defining allowable states within that system. We observe that *another system* can generate these starting points. Or, *we can do it*. Let's call the first system, system A. System A has a *postulating power in relation to the system B* if it can, as a result of its own processing, specify entry points, premises to another system, system B. Then, system B can take further actions based on these premises (given starting points.) This is how we construct a fully functional dependence of two systems. Therefore, creative thinking process will have the following steps: we find the axioms of one system, system A, then determine postulating capabilities of that system, i.e. it's capacity to bootstrap processes in another system, B, by choosing starting points in the system B. Laws and rules governing the system A can be quite different from the laws and rules inside the system B. What links them is the fact that the first system (A) can define a starting point, a premise for the second system (B) to take action, which then processes it.

Whenever we create something new, we start with a premise or postulate. In the web of postulates hides creativity. A premise is an initial assumption, an initial starting point we consider to be true. However, in a

creative thinking, sometimes you have to assume that something is true without being sure if it is a correct assumption. You have to do this so you can further experiment by deriving logical results from that assumption, which themselves may be true or they may lead to a contradiction. If you come to a contradiction, then initial assumption is false, but you probe again with new assumptions until you get meaningful results.

It is imperative to recognize the initial premise inception as an important step, because every reasoning process starts with what we assume to be true. Sometimes, that assumption comes from our previous reasoning, our guess, intuition, or scientific inquiry. All of these sources can have substantial degree of influence in the reasoning process, depending on the circumstances.

Take, for instance, emotions' role in our reasoning. Emotions can influence our decision making, but not before they influence our selection of premises – what we will assume and accept to be true, based on those emotions. Emotions influence our assumptions what is true and through that step they influence our process of decision making.

To explain further what the Premise Based Implicative Truth Synthesis is here are two examples.

Let's say you want to be a racing driver. How would you watch a race with this in mind?

You can start with these observations: the race is in progress; your favourite driver is driving quite well. Although you probably cannot see, your driver certainly presses the gas pedal at different rates along the track, she shifts gears in the most effective sequence she can, and she quickly steers as a response to the tracks' conditions, her own speed, and the other drivers' positions and speed. Everything looks harmonious, connected, because all things fit together into an event called car racing.

This is how your experience looks like without Implicative Truth Synthesis point of view. This experience alone is not sufficient to become a racing driver, because you are a mere consumer, not a participant.

Now, what will happen if you look at the race through the Implicative Truth Synthesis mind lenses?

I use one term from mathematics - axioms, just to be precise in the definitions. Although it sounds exotic, this concept is quite manageable to understand: axioms of a system are the statements that describe how to obtain any state of the system.

Defining any system via its axioms allows you to focus on the possible states that system can take. In the example of the racing car, the engine can be one axiomatic system. The engine's axioms define the starting points of how you can define and reach any state within

the system – within the engine. Hence, the axioms of the car engine can be:

- engine can start
- engine can run with different gas intake
- engine can run at different speeds depending on the shifting gear
- engine can produce different torque at the different speeds and the load torques

These are the car engine's axioms!

States of the engine, derived from these axioms, can be:

- the engine starts
- the gas pedal moves along certain positions causing different amounts of fuel to be injected into cylinders every second
- the gear changes several times per minute thus changing engine's output torque
- he temperature of the engine changes over time.

At each point in time the engine is in one of these allowable states. When I say allowable it means, for example, that with certain amount of gas and with certain gear shift, engine will produce only a certain amount of torque, allowable by physics laws. However, physics laws can dictate only how the engine will respond - they can not

control the driver's creative input like how much he or she will press the gas pedal or which gear shift he or she will select.

As you can see, car engine can have many allowable states which its axioms can "create". We will focus more on these states rather than on the axioms because axioms are fixed, they don't change, while the states can change over time - they can be continuously transition from one to another.

So, allowable states of a car engine are any physically possible combination of the following: the amount of fuel (gas), the gear, and the produced torque. This obviously can change during the race or when the engine is on the test table in a factory. Now, note how the engine designers and test engineers don't know which of those combinations will happen during a race, the combination reflecting the racing strategy of the driver! Engineers' work in another axiomatic system decoupled from the racing strategy. They only want to deliver to a driver a lot of possible, allowable states of the engine so she can skilfully race, and possibly win. This *decoupling along the axiomatic boundaries* allows engineers to focus only on the engine design and not on the driver's skill or her mental state during the race.

After a company purchases a car engine and mount it in its racing car, it's time to name a driver. Notice

how the company can choose any driver. The engine really doesn't care who is driving. It will only do what is promised by its design: to produce a certain torque for a certain sequence of gas pedal locations and gears selection. Who is creating the sequence really does not matter to the engine. But, for the company it does matter who will drive the car! The company wants to choose the most skilled and experienced driver. And here is where the Implicative Truth Synthesis commits in. When the driver takes the seat and when the engine is on, driver will select some of the allowable states of the engine. The driver's thought, signifying intent to drive in a certain way, implies that he will press gas pedal to some degree and shift gears to certain level. This implication synthesised a new truth: driver is pressing the gas pedal and the car engine is responding in a desired way.

Imagine that company needs to select one of three drivers, all member of its team, after they race against each other. They will drive the cars with the same engines. You can immediately see how the design of the engine is an independent axiomatic system from the strategy how to utilize it. Drivers are linked to the engine via Implicative Truth Synthesis – given the driver's strategy it implies that the driver will press gas pedal in one way and change gears in another thus causing the engine to perform in certain way. These synthesized truths are significant – they

will separate “good” from “bad” drivers and the best will win. It will not be up to engine who will win, it is the same for all drivers – it will be up to the driver. This is how the team can possibly win the race – to choose the best driver among them.

The driver, with all his or her skills and experience, represents one axiomatic system. Driver can be in any mental state ready to drive, to press gas pedal, to steer, to change gears; her decision making during race, her legs and hands positions, are all allowable states of the axiomatic system called “the driver”. These states are derived from the driver’s axiomatic system which contains axioms:

- the driver can analyse the road conditions
- the driver can press the gas pedal
- the driver can change the gears
- the driver can analyse his own speed and the speed of others
- the driver can make the decisions how much to press the gas pedal
- the driver can make the decision how to shift gears
- the driver can make the decision how to steer
- the driver can steer

The driver's axioms define what the driver can do. The allowable states of the system called "driver", tell us what she actually does.

Note the parallel existence, yet independence, of the described axiomatic systems – of the driver and of the engine. They don't need to be linked in any way and, moreover, they have their properties independent of each other. The driver can be sitting in a pub having an orange juice, and still the axiomatic system holds for him – he can steer (but he doesn't, he is drinking the juice), he can process the conditions on the track (but he doesn't at the moment), he has ability to press gas pedal, etc. While sitting in the pub he is still an experienced racing driver although he doesn't race at the moment because he is having his juice.

Similar can be said for the engine. For instance, the racing car can be in the garage, so the engine is not turned on, yet all the axioms hold for that engine: engine can start; engine can run with different gas intake; engine can run at different speeds depending on the shifting gear, etc.

The creative, innovative process starts when we connect these two systems via Premise Based Implicative Truth Synthesis - and this happens during the race, when the driver is in the car and the engine is running. We pick premise (an allowable state) from the system A (driver!) which will imply selection of an allowable state from the

system B (engine!). The driver has a *postulating power* in relation to the engine – he can postulate a state of the engine based on his reasoning. When he makes a decision, he will press the gas pedal to a certain degree thus defining the state for the engine and engine will respond to that amount of gas in the way it is designed for. The new truth has been synthesized – the engine starts to run as per driver's input from gas pedal and gear shifts.

Notice how we bridged (linked) two systems – the driver and the engine! I call this bridging process *crossing axiomatic boundaries using postulating power from the system A in relation to the system B.*

Without this bridge across the axiomatic boundaries there is no invention, there is no link – driver can still drink his juice and the engine still can be in the garage.

From the vast amount of combinations during the race, consisting of driver's reasoning about the track conditions and the other drivers, and the timing and sequence of events such as pressing gas pedal, shifting gears, and steering, only certain combinations will be the winning ones! Of course, driver cannot test all the combinations to see which will work – but she is aware of this fact! Based on her experience sometimes she chooses bad combinations (lose the race) or sometimes she keeps choosing right combinations all along – and she wins the race!

By *decoupling conceptual systems along their axiomatic boundaries* you can get a clear picture what to focus on. As a driver, who learns how an engine can react to certain inputs, you will focus on training – to drive many times along different tracks, thus gradually becoming familiar with the wining timing of pressing gas pedal, shifting gears, and steering. This experience will help during a real race. On the other hand, as a design engineer, you will less focus on different strategies during race, but more on the engine design – using engineering principles and laws of physics you build the engine that will give required racing performance.

In order to have an outstanding invention (winning a car race is a kind of invention) you have to choose the appropriate systems and characterize them via axioms and allowable states. You have to choose the winning systems A and B which you will link via implication. What will happen if you don't choose the right systems? If you put an inexperienced driver (system A) in the car (system B) you most likely will not win the race. Or, if you put an experienced driver (system A) in the car with an inadequate engine (system B) you again, most likely, will not win the race. Choosing winning systems and linking them via Implicative Truth Synthesis is the core of my method for *success*, and this approach can be applied to virtually any set of systems.

As you continue to read you will learn how this method of *decoupling systems along their axiomatic boundaries* and Premise Based Implicative Truth Synthesis can be applied not only to car racing but to such fields as mathematics and physics, finance, software programming, arts, music, and, essentially, many areas of your life.

As the next example, let's consider the process of artistic painting. Artistic painting's axioms relates to the *ability to select* brush strokes and colors. On the other hand, the process of painting's allowable states can be all possible brush strokes and all possible colours (and their combinations.) Systems axioms *allow* these states. Axioms describe the ways how to obtain different states of our system. The power of the axioms is that they are sufficient to fully describe any system, in this example the painting process. Allowable states, derived from the axioms, in this case from the painting process, tell you what you actually see when you observe a painter at work. For instance, you can discover that she has a palette of colors, that she mixes the colors, and then, using brush strokes, she composes a new artistic statement each time she touches the canvas with her brush (with the composition of lines, surfaces, shapes, and colors, the painter tries to convey her message to us.)

Now, let's talk about different level and different sets of axioms.

Once we look at the painting, a new truth has been created or synthesized. The truth of how we experience the painting, our evoked feelings when we look at it, our human, aesthetic experience of it. That truth did not exist before, even a moment before we looked at the painting.

Moreover, we, as humans, are “designed” to do many different things and follow many trains of thoughts, and one of them is experiencing and enjoying art, in this case a painting. From that perspective, we can define a new axiomatic system, a system that describes us, our emotions, feelings, intellect, passions, our capability to look at, and experience the world, around us.

When the painter let us look at her painting, she created a logical jump, an implication: if she made a painting then it implies we could enjoy it. This example of implication which synthesized the new truth from two previously existed truths (namely “painter is using brush strokes to form shapes” and the truth “we can enjoy the painting”) illustrates the core of the method of Premise Based Implicative Truth Synthesis. Bear in mind, something is needed to trigger our aesthetics ability to enjoy art. Nothing is happening if we walk on the street passing by an art gallery. Our artistic axiomatic system is idle, no premises or initial triggers take place. But, once we enter the gallery and stand in front of a painting, a new truth associated with our experience is created; artistic

axiomatic system is awakened within us and starts triggering those premises how to enjoy art. We, as humans, just *crossed the axiomatic boundary* that envelopes two axiomatic systems, which are “the painter used brush strokes to create a painting” and “we have capability to enjoy the painting.”

Of course, a painter himself represents an axiomatic system. Those axioms are that she can paint, she can also experience world around her, and using her talent she can form and convey a message on canvas using her painting skills.

Hence, here, we have three axiomatic systems in place. First is the painter. Using painting axioms he or she paints, creating new artistic truths on canvas. The process of painting is the second axiomatic system. The first axiomatic system, the painter’s, has a *postulating power* – it can select and postulate initial states of the second system - brush strokes, color mixing, and painting on canvas. Then, moving from painting to us, to our, the third axiomatic system, as audience, painting transfers its message by invoking specific emotions and feelings (from a huge number of all possible emotions, feelings we have), that we have experienced while looking at the painting. Painting is now a premise for us, a given, a-priori, initial starting point for our axiomatic system “we can enjoy art”. When the painting is present and we are in front of it, it

implies that we can start enjoying it. From two truths, namely, “it is true that the painting is given to us”, and another truth “we can enjoy an artistic painting”, we construct an implication, a new truth, the real event: there is an artistic painting with implication that we are enjoying it. New truth is synthesized while we experience the painting. The presence of painting implied our enjoyment and experience of it. That’s the Premise Based Implicative Truth Synthesis.

Note the significance of the truth synthesis during implication. Without it we would have two separate, disconnected axiomatic systems: a painting which, let’s say, hangs on the gallery’s wall and nothing happens, and the second axiomatic system, which is our “capability to enjoy an artistic painting,” which, again, is completely idle in the absence of an instance of a painting to look at. Only when we stop and stand in front of a painting something happens. Two axiomatic systems get in contact. Painting’s message flows into our brains, our capability to enjoy art kicks in and we have full artistic experience. This truth, via implication, “there is a painting hence we are enjoying it” is synthesized by our behaviour and explains the name Implicative Truth Synthesis.

Using axioms you can construct any allowable state of the system. But, for success, you have to choose the winning ones. An example of an allowable system state in

the process of painting is: the painter can randomly mix colors, can do random brush strokes on canvas, and draw various random shapes. But, it may not be called an art. You can use a primitive robot to put random colors on the canvas, but that painting would not make any sense. We need something more. When a painter put a thought into what he or she will paint, and how, then her brush strokes and colors on canvas will make a lot of sense. It will add the artistic value. So, here, we use implication to connect two axiomatic systems – one is "the painter", the other is "all brush strokes and all color mixes". The painter's axiomatic system has *postulating power* to initiate certain starting states within the second axiomatic system of, "brush strokes." So, when a painter has an idea in his mind then it implies he will make a specific brush strokes and mix only certain colors. We crossed the axiomatic boundaries here with this implication. We influenced selection of starting points in one axiomatic system ("series of specific brush strokes and color mixes") by the result from another axiomatic system ("an internal idea of the painter which he wants to transfer on canvas".) As you will see later, every creative process will consist of these steps: dividing the bigger system into smaller *axiomatic systems*, delineate those using *axiomatic boundaries*, then find the implications that *cross axiomatic boundaries* and

synthesize new truths. The products of our creative process are exactly these new truths.

Let's talk about some axiomatic systems linked to art. A painter, as a businessman or a business woman, who wants to sell her art, is aware (consciously or unconsciously) of this axiomatic systems interplay. As an artist, she must be capable to invoke powerful emotions to each art gallery visitor who stops in front of her painting. Moreover, in order to commercially succeed as an artist, he or she has to universally appeal to every human, or at least, to those who can appreciate art. And, while she may spend days or months working on the painting, the condensed artistic message must be often conveyed to an art gallery visitor in a matter of minutes. On the other hand, we, as humans, have our values, among which is that art matters to us. We are ready to pay millions of currency to own a work of art (for instance a painting). And, here we generate another axiomatic system that describes our monetary social mechanisms. The banking system also plays a role, as well as personal wealth, even telephone electronic technology bidder uses while bidding (at an art auction). Each of these systems, the bidder, the wealthy individual, the subjective monetary value of the painting, the monetary system, the telephone communication system can be delineated and described via their axioms, while Implicative Truth Synthesis connects these "systems"

via premises and implications (look at all connected activities that happen during an auction.) If an artist wants to sell her work she has to be, and is, aware precisely of all these systems and their connections, but perhaps under different labels.

From axioms you can build any or all parts of a system starting with premises. Often, within the system, you can consider your premises to be axioms for that particular part of the system only because, by definition, axioms are starting points; statements accepted as true which do not need to be proven within the system built from them. It does not mean that axioms cannot be proven in another system and linked via Implicative Truth Synthesis to the system those axioms can build. For instance, a number is, so to speak, non-provable in mathematics, it's given, it exists a-priory, yet the whole mathematics is built on it. But, in psychology or neuroscience the concept of a number can be proven and researched separately.

Your road to success consists of choosing a winning system with its interrelationships and your awareness that it is an axiomatic system, that you have postulating power to initiate starting states, conditions within the system, without proofs. This system will produce results, range of truth values that could imply another truth, a postulate, in the next, linked system, synthesizing the

new truth from this implication. With this, the Implicative Truth Synthesis method *liberates you from the boundaries of one system or one domain of knowledge.*

The system will be called the winning system if, at the end of the chains of Implicative Truth Synthesis steps, it has tangible social value, if it gives something what matters to us, something what we value.

Defining system via its axioms gives us the advantage to analyze any system in the correct way – using logic (which is the science of analyzing and manipulating truth values, the same way mathematics is about numbers, and music is about tones.) If we want to create a new truth, new invention, new original entity, we connect the two axiomatic systems via Implicative Truth Synthesis.

After you become familiar with more examples of Implicative Truth Synthesis, you can visit this chapter, any number of times, and use it as a reference,

3. Examples of Premise Based Implicative Truth Synthesis

3.1 Applied mathematics

Mathematics introduces the number a-priori, without any proof – within mathematics a number simply exists, it is given. The central property of applied mathematics is the nature of specification of that initial number entering the computation. It's up to you in many cases what that starting number will be.

Different professions or industry disciplines give name to the applied mathematics field. More preciously, the professionals who pick the initial numbers, as inputs to mathematics, define the field of applied mathematics. Sometimes processes within an academic or industry field generate the starting numbers for mathematical analysis.

For example, for mathematics application in physics, the initial number generating process is the measurement and the discovery of quantitative relationships in nature; in finance, bankers choose an interest rate or a trader specifies the stock price; in economics, economists define initial numbers representing demand and supply or the price of the goods; in psychology, the psychologist specify the number of subjects in a statistical behavioural experiment.

In the fields of applied mathematics, it's actually the inquiries extraneous to mathematics that generate initial, entry point numbers, the initial premises.

Within the field of mathematics application (economics, finance, trading, psychology) there are no new mathematical operations or new kind of numbers - they all come from, and belong to the same, “only one” mathematics.

The fields to which mathematics is “applied” (economics, finance, psychology…) are axiomatic systems because they have their own axioms and inquiry methods and the common logic that supports them. This is important observation for the application of Implicative Truth Synthesis. Since mathematics is also an axiomatic system (where the word axiom comes from) the other systems of its application have *postulating power* to select the initial numbers for mathematics, which are considered “given”, for further calculations. A whole philosophy of reasoning and decision making takes place, within the discipline extraneous to mathematics, before this first number is chosen.

Once you enter the mathematical world it really does not matter where the initial number came from. Mathematics sees only that number and has its own rules to process it.

Also, by adding the word “quantitative” to the field of application, we generate a new applied mathematics name. Therefore, we might have quantitative psychology, quantitative sociology, quantitative marketing, quantitative archaeology. “Quantitative” means that there are non-mathematical relationships in the discipline that generate, postulate numbers as starting points for mathematical calculations. Mathematics, then, returns obtained mathematical results back to the original discipline (psychology, archaeology, etc.)

Since we consider the first system, one which mathematics is “applied” to (psychology, archaeology, trading…) to be axiomatic, and since mathematics is also axiomatic, by introducing quantitative relations between these two systems we *cross axiomatic boundaries* between them.

For example, let’s look at the stocks trading. Price is, of course, an influential element in this activity. Certain rules exist that precede the price specification, and these rules can be related, for instance, to weather, political events, or certain consumers’ behaviour. These are, in many cases, non-mathematical relations and laws. Hence, based on the conclusions coming from these domains, a trader will state the price. For instance, “based on such and such consumers’ statistics and current weather, the price will be $21.50.” Once you have the price, that

number enters mathematical world and is subject to all those relations and rules that apply to mathematics. Mathematics does not care if number 21.5 comes from trading ($21.50), from physics (speed 21.5 m/s), or from weather (21.5 degrees Celsius). Mathematics deals only with numbers! Many kinds of non-mathematical relationships can generate these numbers, and in the case of our trading example these non-mathematical relationships refer to the weather and consumers' behaviour.

When we state the price of $21.5, we *crossed axiomatic boundary* between our trading reasoning (weather, consumer's behaviour, political atmosphere) and mathematical world, by postulating the price of $21.5, thus giving to the mathematical world number 21.5 to work with. Therefore, our trading axiomatic system has *a postulating power* – it can postulate a starting number for mathematics so that mathematics can process that number further. We synthesized new truth via implication which states "based on consumers' behaviour and the weather conditions the price will be $21.5 and it implies that number 21.5 will be our entry point (postulated!) to the further mathematical computations". This is the example of Premise Based Implicative Truth Synthesis.

One of the major hurdles to understand math concepts appears to be, as I call it, the 'misleading

language' often used by mathematicians' community. How many times you stared at some mathematical term or equation, and had a feeling you are in front of a wall you are required to climb and go over it, or, even worse, go through it, but you don't have any tools at your disposal to do so? And, perhaps, on top of that, you are pressed by time, for instance during an exam. You felt helpless, without any groundbreaking idea how to proceed forward.

And, how many times you questioned your mathematical ability by considering your school test results? (I have news for you - they are not the only measure of your mathematical powers!)

So, you are frustrated; you feel helpless, even scared thinking about the consequences if you don't know the math!

Well, fear not anymore! I have a remedy for that situation! I have a cannon for that wall! After my explanation of the core challenge, and when you combine that knowledge with my Postulate driven Implicative Truth Synthesis method, you will be in a position to significantly advance in mathematics. You will be able to tackle almost any mathematical text and, after some research, fully understand what is it about. You should be able to manipulate numbers, matrices, mathematical curves like real tangible objects in your mind, rotating them in 3D, thus visualizing quantitative relations for better processing. You

will find the reason and purpose behind the fragmented mathematical lectures you have attended so far.

The central solution idea is very simple, yet perfectly adequate. The core of the issue is the habit of mathematicians to label, name mathematical concepts using words from our real human experience, from everyday life, or using the names of people. With this approach, mathematicians not only mask the core of the meaning of the math concept, but also misguide the reader to a different and ineffective train of thoughts. Mathematicians are almost forcing reader to map an unrelated term to a concrete mathematical concept. You really don't know what is worse – naming a math concept by some famous mathematician, or use ordinary word from everyday life with misguided association that leads into indecisiveness and confusion.

So, let's start with shading light on this matter!

To form a correct relation between a name or label for a mathematical concept and the concept itself we should first clarify what a mathematical concept is and what it can be. By answering this we will build a foundation idea of everything else that will come later as well as how to deal with an arbitrary name given to the mathematical concept.

Mathematical concept is almost exclusively a set (or sets) and the sequence of set operations on them. Every mathematical concept can be explained and

represented by sets and related sets operations. We all know sets, right? They are simple concepts. And main operations are straightforward: you add elements to a set, or remove elements from a set. You can combine sets, find union, intersection, etc.. Now, to develop mathematics into different branches what do we need? Sets, of course, and specific, postulated sequence of operations on them. We are free to postulate sets. We are free to postulate operations on them. By doing this we can, actually, define starting points of any branch of mathematics. And going in the other direction - when we see a mathematical symbol and formulae we immediately should think what are the sets that are postulated, and what are the postulated (given) operations on them. However, often, we will not need to go all the way to the sets, although it won't hurt. Instead, we can think of numbers and sets of numbers. Then, again, every number is a collection of something, a count, a kind of set – hence, we will be dealing with sets again.

Here are just some of the mathematical concepts that can be fully described by sets or sets of numbers and operations on them:

function – pairs of values; this definition is not concerned how the pairs are obtained. Another definition is a map or association of two or more numbers. Functions are

generally postulated. You often do not need a proof why you chose such and such function. There are infinitely many functions and hence infinitely many postulates. Even when a function describes behaviour of a physical object or process it is still a postulate, starting point as far as mathematics is concerned.

integral – a way to sum up certain numbers you specified or postulated. Numbers are counts and always come from sets. The operation of integration is also postulated. So, in terms of sets or numbers you redefine integral as a specific way to sum up numbers.

equation - compares sizes of sets.

differential equation – equation that uses differences of some function

matrix – selected or calculated numbers displayed on the page in an rectangle. The rules are specified what to do with these numbers. You can do whatever you want but you often chose to do something you can benefit from.

norm – a way to define a size of a set which can be number, function, matrix.

metric – distance between mathematical entities (functions for instance) similar to the distance between numbers or difference of set sizes.

convergence – approaching certain set size by calculation or by manually removing or adding elements to the set. You need norm and metric to achieve convergence.

Approaching certain number by picking closer and closer numbers or obtaining closer and closer numbers by some calculation (operation).

derivative – certain, postulated sequence of operations on functions, which in turn are operations on set of numbers, which in turn are operations on sets.

compactness – misleading nothing-to-tell term for some property of sets of numbers and sequences of numbers.

limit – picking elements of sets or numbers arbitrary or following some rule.

space – set of numbers, functions, vectors, or matrices with certain numerical properties.

A note about inequalities. Although they appear to be trivial and, at the first look, useless, inequalities in mathematics are important because with them we can check if a series is convergent. Why do we need series? Because once a function represents an infinite-dimensional point we can determine limits, derivatives, integrals and form the approximate solutions of differential equations, especially partial differential equations (PDEs). Thus, norm (size), metric (distance), and the inequalities are very important in mathematics (specifically in functional analysis). And you will not stop here. With Implicative Truth Synthesis you will be able to ask and answer important questions – how PDEs' boundary conditions influence the society.

As an exercise, find a good mathematical dictionary and for chosen terms try to give your own definition using only sets, numbers, and operations on them. Ask yourself, what numbers or sets are postulated in this term and what operations are specified for them.

With our new method we can formulate alternative way of looking at the mathematical formula. No matter how the symbol may look strange, intimidating, or a name that tells nothing about the underlying concept, we should only look to which postulated sets and postulated sequence of operations on them this symbol refers to. We will completely ignore the name and, instead, look to what kind of sets and sequence of operations on them it refers to! Once we know that, the name is not important (never was).

Name has a convenience that many people may know or learn about it. But, that's the only positive thing about it. Name is only a shortcut. You can fully explain any mathematical concept without using any name – only by using sets and operations on them!

Ideally introduction to any new mathematical concepts should not start by stating the accepted name for it. Instead, the talk should start with postulated sets, operations on sets, or related sets of numbers. Only when this picture is clear the arbitrary label can be introduced.

With postulating power you just gained you can form your own solutions to mathematical problems – it will

be you who will come up with starting sets and required operations on them.

3.2 Human behaviour

Perhaps the best example of Premise Based Implicative Truth Synthesis is the human behaviour.

For a mind's given input any course of action (within the physics laws) is possible. Which action will be taken depends on the person's internal analysis of the given information, the person's emotions, feelings, impressions, perceptions, and rational reasoning. Implicative Truth Synthesis is the main reason a person can initiate any action based on any kind of reasons. Hence, it is of utmost importance how we, humans, infere information that will motivate, initiate their actions. There is no causative link, in the sense of physics laws, between reasoning, decision making and which action to take. We have free will. We can take any action for any reason whatsoever, therefore we directly form an implication from given information and actions that we take based on that information. Reason A implies that we will choose to take action B. That's where Implicative Truth Synthesis comes into play.

An information can motivates us to do a certain thing. But, we don't need to do it although we can. A

premise is the information we have. This information belongs to the axiomatic system A consisting of all relevant information available to us. Second system, the system B, is the system consisting of all possible actions we can take. These actions may not be based on the information we have. But, if we take information we have into account, and based on it we take an action (selected from all the actions we can take) then we *crossed axiomatic boundaries* between the systems A and B, and synthesized a new truth: given information from A implied that we chose to take action from B. This exactly illustrates the Premise Based Implicative Truth Synthesis.

There may not be more inviting and challenging goals as to structure information in such a fashion as to influence decision making process of humans, as the members of the society, in a desired way. Psychology, politics, economics, marketing, are all great examples! And Implicative Truth Synthesis is in the center of it.

3.3 Physics, engineering, and mathematics

As I mentioned, the trick is that mathematics has its own rules, and is an axiomatic field. The only entrance to mathematical world is by choosing starting numbers, postulating (without proof) initial numbers, initial conditions,

and/or choosing a set of initial mathematical operations. Given these inputs you can obtain results in mathematics.

I will quickly repeat what I wrote about physics and mathematics. The relations in physics, say motion, momentum, energy, are quantifiable. This, in other words, means, they can generate numbers, supply numbers that are initial conditions for mathematics. That's the link. Only through a postulate combined with implication, two different axiomatic systems can be functionally linked. So, in physics, non-mathematical events postulate numbers as a-priori inputs (no question asked!) to the mathematical system. Then, inner processes within mathematics, logic playing the major role, accept this spectrum of initial values and do the job on them. After the computation is finished, mathematics returns results to the world of physics.

The significance of the concept of a *premise or a postulate* which is the part of the method name, Premise Based Implicative Truth Synthesis, can be further illustrated.

Natural sciences are closely related to the physics and laws of motion. Relations between force, mass, energy, velocity are described the best with partial differential equations (PDEs). Methods for solving these PDEs are well developed and documented. The solutions can have either closed form (analytical solution) or they are numerical solutions. But, the question is, if the methods of

solutions are already well defined, what is then left to discover? The answer is related to something that most undergrad and some grad courses mention but miss to emphasise – the initial and boundary conditions for PDEs.

Usually, when solving a PDE, you have a domain of interest for which you have a governing Partial Differential Equation and boundary of that domain. It is this boundary (and/or initial system state in time, called initial condition) that needs to be specified, postulated. It will be given, a-priori, information to solve a PDE. There is no ready-to-use formula to postulate these boundary and initial conditions. It is up to the creative capabilities of the person defining the problem to postulate these conditions. This specification or discovery can be a trial and error process or a follow up on some previous results from related experience, or even using intuition. Even then, there is no guarantee that the solution of PDE, with specified boundary and initial conditions, can be found; it may also take an unspecified amount of time to find it, and, if found, there is no guarantee that the solution will be the one you are looking for!

But, what is important here is that the boundary and initial conditions are the gates for the creativity, the originality; it is a fertile land for genius of the person involved in the problem solution to shine. Postulating these

initial conditions explains the word “Premise” in the Premise Based Implicative Truth Synthesis.

For instance, the Wright Brothers, when designing the first airplane, were looking for the winning airfoil (wing cross-section) shape. The experimental setup of their wind tunnel and measurement devices established the governing aerodynamics PDE. Their research focus was the winning shape of the wing and its cross-section, airfoil. The airfoil is the boundary condition the Wright Brothers were looking for! After performing a number of experiments, with different wing shapes and cross-sections, they came up with the solution and made their first successful controlled flight. The rest is history. Note that, during their discovery process, not all airfoils (boundary conditions) gave satisfactory results. The Wright Brothers had to come up with numerous airfoils to find the right one in order to get the plane up in the air. Their reasoning was one axiomatic system, say system A. The flying wing was another system, B. By postulating correct wing shape and airfoil, the Wright Brothers *crossed axiomatic boundaries* between these systems, A and B. The correct airfoil implied the aircraft will take off. The implication synthesised the new truth, “the correct airfoils implies that aircraft will fly”. This is Premise Based Implicative Truth Synthesis.

Nikola Tesla postulated design of his asynchronous motor, whose construction, in general view, represents the initial and boundary conditions for the relevant Maxwell's partial differential equations of electro-magnetism. There is no formula that would tell how to set up these initial and boundary conditions, in this case, how to design and build an asynchronous electric motor. In other words, it is the creative talent of an inventor that will postulate how to bend, wind metal wires, how to specify the size and shape of magnetic core, and how to put them in a functional relation that works.

Let's now look at the architecture.

Where is the connection zone between the physics (engineering) and the art in architecture?

It is exactly in the concept of boundary and initial conditions, which are the "Premise" part of Premise Based Implicative Truth Synthesis. Consider a beam that holds, for instance, a side wall of a building. The static force distribution on the beam is described by governing PDE (Partial Differential Equation). If you put a wall on the beam, the wall will exert force on the beam, and this force's distribution will depend on the wall's shape. Given this shape, which is a boundary condition for the beam's PDE, we can calculate the distribution of final force load on the beam, thus determining whether the beam can withstand the wall's weight. There is no given formula that

will tell us what the shape of the wall should be. It is up to the creative talent of an architect, building the wall, to determine its shape, driven by his or her aesthetics intelligence. Physics can help her to calculate the force on the beam given certain wall's shape - the wall's shape is the starting point for this computation. But, physics cannot help her to determine the shape of the wall. In the case of architecture, the shape of the wall is chosen to satisfy human aesthetic criteria.

From the Premise Based Implicative Truth Synthesis point of view, the wall's shape, as a boundary condition for PDE, is the premise that enters world of physics from the world of art. The art is the first axiomatic system, say system A. The physics of force distribution on the beam is the second axiomatic system, system B. With the boundary condition (the shape of the wall) we *cross the axiomatic boundaries* between these two systems, postulating the initial force distribution for the calculation, thus synthesising the new truth: the chosen wall's shape implies the beam's force distribution calculation to determine whether the wall can stand it. With the shape of wall we satisfy the aesthetics criteria and with calculated force distribution we satisfy engineering requirements for function and safety.

3.4 Electronics and digital circuits

Implicative Truth Synthesis plays an extensive role in the design of logical gates. For given input voltage the specific connection and configuration of active and passive electronic components generate desired output voltage. Or, given the initial voltage as a premise, it is implied, by our circuit design, that certain output voltage will be obtained. Note that we can choose, by design, almost any output voltage for any given input voltage (within the laws of physics). This mimics how the human mind works – we can take any action for any given reason. Hence, the wide presence of electronics and electrical engineering in the world around us

In the design of an electronic logical circuit (logical gate), our premise is input voltage. It is given, postulated information to the circuit. The mechanism that selects this particular input voltage (can originate from our reasoning or from another circuit) is the first axiomatic system, say system A. The digital circuit itself is the axiomatic system B. By stating the input voltage we crossed axiomatic boundaries between these two systems – A and B. System A, our reasoning has postulating power to pick a starting state of the system B – digital circuit.

Next step is the design of our logical circuit to produce specific output voltage given the input voltage. We synthesized new truth via implication – given input voltage

implied certain output voltage. We created this implication by our circuit design, hence we have all of the components of the method – Premise is input voltage, Implicative is how we linked input and output voltage, and that's the truth we just synthesized – Implicative Truth Synthesis.

3.5 Music

Consider the acoustic guitar. The selected fret's position, the string length, will dictate the frequency (pitch) of the tone. There is a number of different frequencies a performer can choose and generate. When playing an instrument, a performer postulates a sequence of tones. For a listener, they are the starting points, the points of departure of the musical piece, and the beginning of the listening experience. Music is a sequence of tonal premises - generated by strings – a melody. Note how the guitar is decoupled from the act of composition. Guitar strings can accept any kind of plucks, but it's up to a composer to create a work of art. From all possible fret positions, tone sequences, and duration, a composer postulates only the ones that satisfy his or her musical aesthetic criteria. Composer has a *postulating power* in relation to the guitar strings. During the process of composition, a composer defines initial (allowable, possible) states of the vibrating strings, which originate from the axioms of the guitar.

Guitar is an axiomatic system. It is independent of all other systems in its surroundings, like, of composer, performer, orchestra, audience. The *guitar axiomatic system* can be defined, for instance, by the guitar parts, the head stock, tuning keys, fretboard, body (resonant

chamber), but most importantly by its strings and all possible tones that can be produced with them. A music piece is a set of notes which are postulated. Consider one particular guitar. Performers can change. Composers can change, also the audience can change. Yet, the guitar remains the same, an autonomous axiomatic system.

With each plucked string we cross axiomatic boundaries, from composer (or performer) to the guitar. The sound from the guitar is crossing axiomatic boundaries that envelopes guitar and its audience. By plucking a string, a performer synthesised a new truth – new tone. With each tone in the air, a new truth is synthesized – audience just heard that tone.

Axiomatic system of an audience member tells us that he or she can hear the music. If there is no guitar, nothing happens. But, if there is a guitar played, it will imply that the listener will enjoy the music. This is Implicative Truth Synthesis.

Compare this guitar axiomatic system discovery, its decoupling and later connection via Implicative Truth Synthesis with the relationship between racing car driver (one axiomatic system) and the car engine (another axiomatic system), or decoupling mathematics from its field of application. The same way mathematics is defined by and enclosed within its axiomatic system, the same can be said about the guitar and the car engine. It is this axioms

discovery for a system that admits further linking with other systems via Implicative Truth synthesis.

Decoupling composition from the guitar, along their axiomatic boundaries, allows us to study the performance and guitar construction separately from composition. Decoupling racing car driver from the car and its engine allows us to study and focus separately on the driver's training and the engine's performance design at the factory.

Hence, with that said, the axiomatic system analysis can also define what your profession could be: a composer, a performer, a mathematician, a physician, a racing car driver, or a car engine designer. Or, you can be more than one – you can cross disciplines. You can be a good musician and skilful racing car driver. Or be a mathematician and a solid guitar player. And all this is seen more clearly through Premise Based Implicative Synthesis lenses.

3.5.1 From composing music to selling concert tickets

Tone by tone, music can evoke pleasant feelings; each tone carefully initiates response in our musical minds, creating musical experience that we share with others.

We can observe that our musical emotional, reactive response disappears after music stops. However,

music can change our mood, and this change can last long after the music stops. We are all aware of this when attending a concert.

This whole positive experience is the reason why good music sells! Captivating, pleasant, inspiring music implies that the orchestra or the band will sell tickets. One truth (music is good) implies another truth (we are going to buy tickets). Hence, the new truth is synthesised: when the music is good we are buying the tickets. Good music (system A) has a *postulating power* in relation to us (system B) – it motivates us to buy tickets. This Implicative Truth Synthesis is the core of profitable music industry. Note that, because we have free will, we can take any action yet we decide to buy tickets.

3.5.2 Mathematics and music

The most prevalent, if not the only, connection between mathematics and music is in the sequential selection of the duration and of the frequency (pitch) of the tones, in order to form a melody. (We also can quantify dynamics of a music piece, crescendo, forte, fortissimo, etc. as well, but let's stay only with tone's pitch and duration, for clarity.)

This tone's selection process corresponds to postulating sets and number of elements in them in mathematics. Hence, no arithmetic, no quantitative

investigation of numbers flow from music to math; only a sequence of numbers. It is because what matters in music is the relationship between successive tones which we are capable to perceive and how these relationships evoke certain feelings and emotions, and not the numerical relations between tone's pitches and duration.

On the other hand, feelings are not a priority in the mathematical operations on sequentially selected sets. In mathematics, you don't get too much of a thrill from stating one number after another or one set after another. Of course, you can investigate convergence or divergence of a sequence of numbers – but, that's the different step from only stating the sequence, and in music we are interested how long a tone will be and not in the convergence or divergence of the series of tones' duration.

There is one additional, important association in this comparison. Musical piece, in general, consists of a melody and a harmony. With melody and harmony we are simultaneously generating and passing more than one number to the mathematical world. How many numbers can we pass, then, at the same time? Let's see. In melody, we have the tone duration and the pitch - that's two numbers. In harmony we have a number of different instruments and instruments groups. A modern full-scale symphony orchestra consists of approximately one hundred permanent musicians, most often distributed as

follows: 16–18 1st violins, 16 2nd violins, 12 violas, 12 cellos, 8 double basses, 4 flutes (one with piccolo as a specialty), 4 oboes (one with English horn as a specialty), 4 clarinets (one with bass clarinet as a specialty, another specializing in high clarinets), 4 bassoons (one with double bassoon as a specialty.)[1] This means that a composer and a conductor can keep in their heads 148 variables - 18(1st violins) x 2(pitch and duration) + 16(2nd violins) x 2(pitch and duration) + 12(violas) x 2(pitch and duration) + 12 (cellos) x 2((pitch and duration) + 8(double basses) x 2(pitch and duration) and so on, which equals to around 74 pairs of different pitches and durations adding up to 148. This is equivalent to the function of 148 variables in mathematics! And instruments are distributed into four different sets - woodwinds, brass, percussion, and strings type. This relates to the mathematical definition of a distribution!

Only the functions of one variable are almost exclusively thought in high schools and some college mathematics courses. Functions of two or more variables are usually introduced in calculus or pre-calculus courses. While musicians may not be so good in arithmetic (they don't need to, it might be as well boring too!) they are quite capable abstract mathematicians, even if they don't know that – they can deal with functions of 148 variables distributed in four sets! Impressive indeed!

Of course, postulating such a big number of variables when, say, composing a symphony, put emphasis on the premise generation. These tones, for various groups of instruments, are actual premises and as such they contribute to the premise part of the Premise Based Implicative Truth Synthesis method.

Back to the sets and music. It is often in your advantage to manipulate abstract concepts quickly. While you will get speed over time, with training, the very process of remembering abstract concepts can be a difficult task – you may feel that you are missing their context and therefore cannot just remember and recall any arbitrary idea or object that floats in your mind. The concepts need to be linked to something!

Music can help here, especially getting a sense about sets – and sets are in the center of all the explanations in math. As you listen to the music, you can, at your own pace, imagine the sets in space that contain dots equal in number to the duration or the pitch of the tone you are just listening. With time you will find this quite amusing – while enjoying the music you can see in your mind circles representing sets with dots within them. You may even be able to move them around in an imaginary space, like real objects, in your mind. When you get accustom to the fact that you can manipulate such abstract concepts as sets, embedded in music context, you will feel

more confident to manipulate numbers in the similar way, and hence mathematical functions which are, in general, just pairs of numbers – pairs of sets. Remember, everything in mathematics is a set and the operations on them. Enjoy your new math world!

3.6 Software development and computer programming

Here, you specify the "sea of initial conditions" consisting of true and false values to be represented by the bits which are passed to CPU for logical processing in order to get the targeted output result. These bits are called business requirements. Actual software development starts with this "sea of premises". Business analysts interview subject matter experts and collect information that will be, through the business requirements document, input to the design document for software developers. Business requirements have *postulating power* – they postulate initial conditions and initial relationships for software developers, who, in turn, assign to bits the initial true and false values based on these requirements or premises.

Business requirements are one axiomatic system. Computer is another. By mapping the business requirement to the bits' state, in the computer, we cross their axiomatic boundaries by the implication: given this

business requirement it implies that the certain bit value will be true (or false). Once a computer has these initial bits' values, it processes them logically using digital circuits (consisting mostly of logic gates) built around CPU and memory. When finished, the results are, again, computer bits representing values true or false. As the next step, these truth values are mapped back to the business domain by linking them to the concepts who's truth value they represent (for example, it is true that temperature is 273 degrees Fahrenheit, it is true that the trading price is $10.00, it is false that the auction will take place on June 12th).

Why are computers so popular and powerful and are successfully used in so many fields?

It is because, once a computer has initial bit states (true or false) it does not care where they came from - computer will do universal logical processing on them for any field.

Many concepts in the world around us can be represented by true or false statements.

Where Premise Based Implicative Truth Synthesis plays role here? Business domain rules are linked to computer systems via Implicative Truth Synthesis, where, at the start, bits' truth values are postulated by the business domain analysts. At the end of CPU processing, the truth values of bits are mapped back via Implicative

Truth Synthesis, to the truth values of the domain of application.

To succeed as a software developer you have to be aware that you have to start with the hundreds of premises represented by truth values of bits (Windows OS can help you input these postulated bits through various windows – text boxes, check-boxes, drop-down boxes…) and, after computer logical processing, you map the obtained truth values of bits, or numbers, to the domain of application. It is an imperative to recognize the central role, importance of premises, design of premises, and premises architecture when designing a software system. Software architecture is architecture of premises which comes from business requirements (finance, medicine, engineering…)

We still can ask why computers can be applied to so many diverse fields given that the computers deal only with the binary 0s and 1s? It's because when you choose the domain where you can claim that something is true or false these true or false values are represented by 0s (false) and 1s (true) within a computer. The domain you chose can be any domain: finance, engineering, medicine, genetics…, and in each of these domains you can form statements that can be true or false.

Let's analyze the Windows programming (the analysis can be applied not only to the Windows operating system, but also to the Android and the Mac's iOS or even

UNIX). In Windows programming paradigm everything is a window – a functional rectangle. The main purpose of the windows here is to accept input values, premises, and display the end results – the output values. In general, when we look at the windows (functional rectangles) on our computer screen, we are not really concerned with their aesthetic appeal – what matters the most is where in the window we can input our premises (called input data) and, subsequently, in which window, and where on that window, the results will be displayed.

Business requirements create premises for our windows! To be a successful Windows programmer you focus to gain massive but structured knowledge how the windows will be displayed on the screen and how they will be manipulated by your code. Windows software libraries can help you with this. Business requirements in general are not of your concern. Why? Because business requirements document will give you your starting points to program windows. That's all you need. In the same way, business analysts are not interested how you will program the windows! They are focusing on their business data and later on the results from your program.

There are two axiomatic systems here. First, say system A, is the world of business requirements. Business analysts have their own axioms, methods, and philosophy to analyze the expert domain to which they seek computer

application; often subject matter experts are interviewed to obtain the most accurate business information: a medical doctor or a researcher in medical software application, trader in financial application, or design engineer in electrical engineering application.

The second axiomatic system is our Windows programming environment, say system B. You, as a software developer, or a software architect, will accept the business requirements through the windows and logically process them giving instructions to CPU via your software code. In the process of programming you can create some errors or business requirements may be logically wrong. Debugging that follows is one example of finding the wrong premises.

Note how these two axiomatic systems can exist without knowing about each other. Business requirements (system A) are created without knowing which software will be used for computation and application. The software development environment is built around Windows libraries and essentially it does not care from which business domain the premises will come. By giving the business requirement document to a software developer, or to a software architect, we crossed axiomatic boundaries between these two systems, A and B. With this crossing we synthesised new truth: given this business requirement from system A it will imply that certain kind of window will

be created in system B. Only through this implicative link the two systems can get functionally connected. And this is the Premise Based Implicative Truth Synthesis.

One note about software development in general. As many concepts mathematics can be explained by (postulated) sets and (postulated) operations on them, software development can be reduced to stack (basic data structure in software engineering) manipulation and push-pop sequence planing. All the terminology in computer science: file, open, close file, handshaking, task manager – any term can be explained and should be thought of as a sequence of values that are pushed and popped to and from the stack. But, stack is also an arbitrary name– it is the name of the sequence of electronic events within the CPU. And all those stories that are endlessly filling books on software libraries, software standards, and programming paradigms can be explained by flavours of stack manipulation steps and variable push-pop sequences. Furthermore, here you can size up what you need to learn, how much, what is “fat” and what is lean essence in the computer text you are reading to gain knowledge in this discipline.

3.7 Famous postulates (premises)

Some of the famous postulates, premises, also called inventions within the corresponding fields, are:

1. The Schrodinger's equation
2. The Nikola Tesla's asynchronous electric motor
3. The Wright Brothers' wing airfoil

Note how it was sufficient to only present a postulate, as a patent for instance, without need to show the proof how the invention has been created. That's the essential property of a postulate or a premise. It opens up the usage of it in other systems moving forward because it is a starting point that needs no proof within the system it is used in.

Premise Based Implicative Truth Synthesis is the core component of any cross-disciplinary project because of its capability to correctly and efficiently connect inputs and outputs of these fields. The expertise level of a team member in these projects is directly proportional to the number and quality of premises she or he possesses and his or her ability to discover and form implications between different systems thus synthesising new truths within an interdisciplinary project.

You will see that, for success, you will need to have a massive but well structured knowledge in the domain of interest, be it the knowledge of the products you sell, engineering or scientific knowledge, or, for instance, the

cooking skills and recipes. But, this massive knowledge requirement does not mean you learn everything without any selection. On the contrary, you will select what matters, what is important, and the volume of this kind of knowledge will be massive. During this process, let's say you are acquiring knowledge from two thick books, or from a number of research papers, you read sequentially, but the important facts and relations between them you distribute in 3D planes, so you can easier form new relationships, from other books or papers, or experiences. Using Implicative Truth Synthesis to analyze the domain of interest by creating axiomatic boundaries will make your process of gaining knowledge way easier. For instance, for my current projects in engineering and software development I did original research in acoustics and thanks to Implicative Truth Synthesis I just skimmed through tens of scientific papers to extract what is important for my project, in which acoustics meets psychology, and this in turn is linked to sound engineering. Contrast that with approach to spend days reading one thick book trying to extract relevant information.

The individual development of disciplines which takes part in a cross-disciplinary project, is possible exactly because they function on the premise-axiomatic principles. Premises define the starting points of inquiry within the field, while axiomatic structure allows solid logical analysis.

Cross-disciplinary projects like chemistry and mathematics, social networks and computer science, artificial intelligence, are also possible because the results in one discipline can specify starting premises in another, and within that new discipline the attained results can specify premises to yet another domain of knowledge. Note how premises can be specified in two ways - by discipline itself, and also as an implication from the result in another discipline. This premise specification is a true statement – result from one discipline implies a premise, postulate in another – the Premise Based Implicative Truth Synthesis.

As a result of the method application, you will, gradually, be able to recognize abstractions underpinning the systems and concepts you are going to conquer. You will see the relationships between these underlying structures, and you will become accustomed to think in terms of the relationships between these abstractions, gaining benefits of information inferred in this way, the information that can change the real system you are focusing on.

When you start associating different ideas, disciplines, skills, or knowledge domains with Implicative Truth Synthesis, you will awaken many different kind of intelligence you have – emotional, artistic, quantitative, musical, spiritual, physical, analytical…

In a number of instances you will stop thinking using ordinary language: instead, you will think in the terms of relationships, possibly existing on several levels, that make up your systems. You will not need to explain your findings and discovered relationships using ordinary language - they will be there, clear and tangible in their own way of existence.

4. A Note on Axiomatic Boundaries and on Overcoming the Bounds of Creativity

Being bounded, enclosed, within only one axiomatic system, where questions and answers start and end within it, without knowing how to bridge, link the results to another axiomatic system (how to cross axiomatic boundaries), can be a huge setback in a creative, multidisciplinary thinking. My Premise Based Implicative Truth Synthesis method is addressing that setback.

While it is essential to delineate system using its axioms to create its axiomatic boundaries, you are by no means limited by those boundaries. There is always an opportunity to connect with another system using Implicative Truth Synthesis.

More important than repeating the content of a subject taught, like a parrot or a copy machine, is to dissect concepts into its premises and axioms – then see their boundaries and, more importantly, discover how you can link these systems with another system by crossing axiomatic boundaries using Implicative Truth Synthesis, as shown in previous examples. While determining premises you discover the relationships abstract mechanism that underpins the concepts and our understanding of it.

It is imperative to emphasize that the analysis of the connected systems should be in the points of

Implicative Truth Synthesis (ITS), possibly more important than focusing on developments within each axiomatic system. Let's take an example of the art of music performance. Consider a microphone and an amplifier. In the Implicative Truth Synthesis connectedness of the systems lies even the division of work. If you don't think in terms of Implicative Truth Synthesis business points, you think as a technician or a specialized electrical engineer developing the microphone and as another electrical engineer developing the amplifier, as separate components. However, project managers are dealing with Implicative Truth Synthesis points looking specifically at the results of each system (the microphone and the amplifier) and how they can be connected together via Implicative Truth Synthesis. Moreover, CEOs look yet at another level at Implicative Truth Synthesis (ITS), connecting the whole product or service cycle together: the singer -> ITS -> the microphone -> ITS -> the amplifier -> ITS -> the loudspeakers-> ITS -> the audience, all the way to the biochemical receptors in the audience member's inner ear, to the music representation in his or her brain, to the aesthetic faculty that recognises pleasant sounds (melody), and to the decision making brain area which decides to pay for the concert ticket, thus generating the company's profit.

Using Premise Based Implicative Truth Synthesis you can uncover different kind of intelligence. Perhaps, still, the first step should be to have an open mind to the idea of different kind of intelligence that reside within our minds. Also, we might need to unlearn certain things and beliefs. When this is out of our ways we can start benefiting from this method, first by choosing our domain of analysis. If we are mathematicians, it might hard be (but not impossible!) to understand logic that lawyers and judges use – because their logic is rarely concerned with numbers and quantitative relations. However, jurisprudence, as a discipline itself, has its own set of premises. That's how we will go about recognizing and awakening different kind of intelligence – by recognizing axioms and starting premises within each system. For instance, assumptions during trial, say by prosecutor, are created on the fly, they are given a-priori, and only then the prosecutor will try to prove them, while defence will try to disprove them. Battling lawyers are not lacking rigour which one can think is reserved only to prove mathematical theorems. The law itself is very complex field, proofs are created on the fly, statements' truth values are assumed, postulated, debated, proved, or disproved. But, there is a system there, in what appears to be a fluid madness, and, if looked carefully even mathematicians can be good lawyers. It's just a matter of the domain to which the

reasoning logic is applied and what kind of axioms and premises define each system – law or mathematics. Logic is an independent and universal tool – can be applied to mathematics, jurisprudence, finance, architecture, music, art in general. But, creativity really lies in premises. Premises often defy the logical principles, yet, even then, they can lead to new discoveries. You win, in many fields, if you have the winning premises plus applied logic. And to have good premises, in many cases, logic cannot help you too much – it can be inspiration, trial and error or intuition that plays the key role in the winning premise generation.

Can we explore and conclude when two systems, on the first sight very different, can be "connected" thus overcoming the bounds of creativity?

As I mentioned earlier, both systems need to be based and to function on the logical principles, in other words, to be defined as axiomatic systems. The creativity lies in the important fact that there must be initial conditions, premises within each system to start the processing within the system. These starting points can be generated, chosen, or postulated by other systems or by you. In this *postulating power* from one system and ability of the other system to act on these postulates, given premises, exists the essence of creative thinking. With this postulate based implications you form a new, fully functional dependence between any two systems.

To summarize the method and how you can use it in creative thinking: you find the axioms of one system, say system A, then with postulating capabilities of that system, i.e. it's capacity to bootstrap processes in system B, you continue with logical processing in the system B with the goal to obtain desired results. You use inspiration, intuition, dreams, previous experience, or expert knowledge to select these initial conditions, premises, and then you use precise logical reasoning to act on them and to obtain further results.

Premise Based Implicative Truth Synthesis can be your bridge to create new, innovative relationships from any set of systems, while, at the same time, it can also be your knowledge acquiring kernel to approach any new field of human thought and exploration.

5. Meditation and Premise Based Implicative Truth Synthesis

Meditation serves the purpose to discover your fundamental mechanisms of perceiving and analyzing the world around you, while you become more and more relaxed. Meditation should ultimately lead you towards postulates formation within your business or your spiritual projects.

Given the pressures society, education, work, and other social factors put on you, you, over the years, may have forgotten your essential values, your effective methods of reasoning and how to be powerfully motivated and inspired.

Meditation should bring all these things back to you. With the right kind of meditation, you should be able to achieve better inner peace, be in the sync with the world around you, and more clearly see if there is anything in your environment, be it intellectual or physical, that is preventing you to move forward towards your goals. Meditation, and especially the awareness meditation, serves to discover inner workings of your intellect - how do you reason about the world around you, what kind of questions do you ask, and what do you do about assumptions on which you base your decisions. Furthermore, the purpose of meditation is to become

aware, recognize, and see the all encompassing habitat, space where all your thoughts, concepts, emotions, and sensory experiences reside. Achieving that will help you to see the dependencies between them. Once you are aware of the dependencies, you can use your capability to postulate starting truths in the desired concept domains, and, ultimately, using Implicative Truth Synthesis, move towards the goal of understanding human nature which is the essential part of success.

Note that becoming aware of your senses and sensory inputs from your surroundings during meditation, is not the ultimate goal. You don't stop at that point! The importance of the awareness is that these sensory inputs reveal the environment of universal intellectual functions, the interconnected web of concepts and their functional dependencies in your mind. The same can be said for emotional awareness, mathematics, poetry, art. Once aware of these core "ideas' manipulating mechanisms" you can use Implicative Truth Synthesis to broaden the conceptual horizons of relationships between different conceptual domains.

There are three powerful, given in advance, mind faculties at your disposal to engage them in your creative action and problem solving. They are Thought Initiator©, Thought Pusher©, and Thought Visitor©. They work in concert with your memory faculties and your analytical

tools which are primarily used to discover axiomatic boundaries of the concepts you are dealing with and postulates inception that lead towards the problem solution. Meditation can be used to become aware of these three faculties.

When you include Implicative Truth Synthesis in your meditation, especially awareness meditation, you immediately expand your reasoning capabilities. Meditation with the Implicative Truth Synthesis goes one important, substantial step further than any other meditation – it prompts you to think and create new truths about world around you. This meditation will not simply leave you with your balanced and calm state (although that matters too) but it will offer you a path forward towards achieving the goals in whatever area of life you want to.

Meditation with Implicative Truth Synthesis can have an aspect of self-directed neuroplasticity. Over time you will feel the connection between neuroplasticity and postulates inception. To me Implicative Truth Synthesis has a central role in cognition and creativity.

As I mentioned, everything is a concept in our minds, including all of our sensory experiences. With awareness meditation, you can discover deeper mind structures where these concepts are lodged. Awareness meditation, combined with Premise Based Implicative Truth Synthesis, should also uncover, for you, the

universal relationships' discovery mechanism. With this mechanism you should be able to step back and recognize, with high degree of clarity, relevant concepts' relationships; they can be tonal relations and their effects in music, relationships in human behaviour, in law, politics, in mathematics and in many other areas. And, once they are recognized, you can act on them. This increases your intellectual capacity while at the same time broadens the horizons of your intelligence. Moreover, meditation will lead to confidence, the confidence will lead to superiority, the superiority will lead to triumph!

Following is one suggestion for meditation that will put in the perspective your creative thinking and social and human values in general, which are the main framework for your success.

Imagine that you are driving a car on a sunny day along a major highway. The signs are passing by. One of the signs is the sign, "Airport ahead," which is a silhouette of an airplane from the top view. The sign is painted in green.

You start with one key observation: *nothing needs to be as it is.*

Then, in your mind you find what is it about this sign of an airplane that needs not to be as it is.

First of all, there need not be a sign there at all. Just the highway and trees on its sides. So, somebody has

to come up with the idea to put the sign there. It's a postulate. But, why this particular sign? Because the road comes close to the airport - next exit maybe. Yet, the airport needs not to be there. Somebody built it but it did not need to happen. The reason why it's built is because people had a need to travel from that particular region. City planners did research, some statistical measurements when and how people travelled before, and then put up the discussion at the city hall if the new airport is a feasible solution. Here you have exact application of Premise Based implicative Truth Synthesis. First, let's postulate that people travel. People want to travel faster. It's their free will. Now, what to do about it? The need to travel faster can imply something. But, it's not causative implication. There is no direct causation between "people needs to travel faster" and "we are going to build an airport". This implication is non-causative because it refers to our free will to do something, to do anything. The first statement does not automatically imply the second! Only when we decide and promise to take a certain action the implication comes to life. So, we rephrase. "People need to travel faster" implies that we will chose to take action "to build an airport". We were free to build anything. Maybe railway. Or new lanes on the highway. Yet, after thorough study we decided to build an airport. Thus, a new truth is

synthesized by our actions: “People needs to travel faster implies that we made a decision to build an airport”.

You can notice how the simple look at a traffic sign, containing an image of an airplane, can outline the framework of creative thinking. Here is the summary. First, we identified premises, postulates. Then, we put that in the social context. It is imperative here to note that, in order to succeed, we need to put our system into social context, what members of society value, what actions they will take based on their values which drive their motivation to act. Next we used Implicative Truth Synthesis. We created a new truth by analyzing present state and possible future human behaviour (here to travel faster by airplane). Note how free will is central here. People will make their decision to fly by airplane motivated by their desire to travel faster. And then you build that airport! This, of course, might lead to innovation regarding airplane types, fuel efficiency, capacity of seats, etc, but we focused on aspects that are important in our example.

Back to the sign. It is built for you, because the traffic engineers and highway planners know that you may need this information while driving. They postulated that fact. They assumed that fact. It was their starting point – drivers need the information where the airport is. Without that information the engineers and designers would not

take any action, like, designing the sign and putting it at certain location on the highway.

You can see how that postulate acted as a *bootstrap* for engineers' and designers' creative actions.

Now, since we are talking about engineers, you may discover the bounds of their profession. They dealt with geographic locations, they drew the sign, cut the sheet of metal, painted it, assembled the sign, and put it on the highway. That's their job. I am sure they alone did not decide if all those actions were to be taken. Most likely, a city planner or traffic planner did that. Hence, the nature of postulates, premises, and who makes them, define jobs specifications and jobs boundaries.

In order to be an entrepreneur, you need to have a sensibility for human desires, interests, needs, and above all what humans value. Technical education is fine, university education is fine, but it alone is not sufficient to become a successful entrepreneur. You need Premise Based Implicative Truth Synthesis to connect your business plans, home business or enterprise level projects, with social interconnected web, with the system of human values. Then you can plan, delegate, execute, maybe become a director or CEO and lead others, engineers, architects to act within their own professions but to satisfy your own goals and vision.

I put emphasis on meditation because with meditation you can become accustomed to the effective way of thinking. You can start with the observation "*this needs not to be as it is*" which leads to the finding of preceding events and motivations why it is as it is, uncovering in the way of your analysis, the bootstrap postulates, humans' initiatives, social and individual human values, in other words the social context in which these objects and actions are embedded. This is very important – you want to find out which individual initiatives and which social processes contributed to the state of affairs or object you are observing. When the goal is success, finding this has higher priority than finding physical reasons (in accordance to physics laws) why something happens. And being aware of the social aspect of anything you do is the main part of success. Further on, you will discover the axiomatic boundaries, starting premises, and using Implicative Truth Synthesis you will become aware how the new truths, you might be after, are formed in this process. Soon, you will be so used to this way of thinking that you will carry out the crown of the method – connect, at the first sight, unrelated systems. This is by definition the creative reasoning nucleus that leads to success and innovative thinking. When your mind is sufficiently well trained with recognizing premise and axiomatic boundaries of the systems, objects, actions around you, you will be

able, in a matter of minutes, even seconds, to make informed and clever design, executive, and creative decisions. With some experience you will know when you make a masterpiece of your ideas.

6. Laws of Physics, Mind, Biochemistry, and Human Behaviour

Our human experience, our behaviours, what we value, what matters to us is above the Newton's laws, the laws of physics, the quantum mechanics. It is because, although, when we act, we act in accordance to these laws, these laws don't care whether we do right or wrong, whether we tell truth or lie. They will uniformly and unapologetically support all our behaviour.

War crimes are committed in accordance to physics laws. Violent assaults are committed in accordance to physics laws. Physics laws don't care if what is done is right or wrong. Hence, it is about our human values, about what matters to us that has the top priority in our human existence and in our human experience. (One valid question worth exploring is when the motion of particles, atoms, molecules, described by Newton's laws and laws of quantum physics becomes thought. We have neuroscience to help us discover that, together with psychology and biochemistry.)

To achieve success it is not sufficient, for instance, to be only an engineer or a computer scientist. What is required, in addition to a specialized knowledge (in any field for that matter), is to be able to exert a positive influence on social relations and human behaviours and to

have an ability to obtain results within fields that have high and positive impact on society.

The question that connects so many different discourses, different sciences, different human endeavours and many other things, in a new combination that works, is – does it matter to human experience?

For instance, in engineering, being it solar cells design, acoustics, or power systems, successful prediction of human decisions and effective prediction of subsequent behaviours motivated by those decisions, drives every successful design in these fields.

Your goals, no matter how diverse they are, in order to lead to success, must reside in, and must influence, human, social sphere, because success itself is a social game.

As you continue to read you will become aware of the necessity of embedding your expert or specialized knowledge in social context.

Deconstructing any system of interest (engineering, psychology, car sales, home business idea, mathematics) into its premises, discovering axiomatic boundaries and points where Implicative Truth Synthesis takes place, in my experience, is directly related to the way how our brain functions in terms of creativity. For instance, while searching for connection points between two systems (postulating capability) you tell your brain to be open to

forming new neurons links, new synapse connections. The current fMRI (functional Magnetic Resonance Imaging) research strongly suggest that single change in one neural circuit can make difference in all other circuits. That single change can be a link discovered and established with Implicative Truth Synthesis. In my view and experience, this way of thinking can influence the brain plasticity as well. Implicative Truth Synthesis tremendously improved my creativity in the field of acoustics and mathematical models of optimization, although I have never had the same lecture material during my university education. My memory significantly improved with this way of thinking because I vividly can recall what questions I asked when looking for implicative connections between two systems, regardless whether I found the connection or not. When I find the connection that worked, the Implicative Truth Synthesis link is permanently embedded in my memory, ready to be easily retrieved when required.

Conceiving premises can be traced way back to the biochemistry of our brains. This might be a subject of new research connecting cognition, creativity and neurosciences. Thinking of something new, the genesis of a new idea, that very first thought about a subject you want to explore in your mind, might be linked to the release of energy stored in our neurons in the bonds of ATP (adenosine triphosphate.)

6.1 Concepts Recognition and Implicative Truth Synthesis

Everything that exists around us exists in our mind as a concept. Even, so called, real objects and sensory inputs. They are all concepts in our mind.

Since everything is a concept, in order to think creatively, you need to distinguish between the a-priori mind circuits given to us by the evolution (evolutionary psychology gives nice, useful insights into this) and what is learned or synthesized. For instance, in many cases, we tend to have immediate reaction to stimuli with built-in brain circuits instead of “thinking through”. The challenge and beauty of Implicative Truth Synthesis is that you (1) become aware that the sensory inputs, emotions, and other a-priori constructs are viewed as objects with boundaries that, in some sense, “float” in your mind and (2) you need to decouple them and reconnect them again in a new, desired way, combined with your own new concepts. In the next step you might ask questions: is there a human experience factor involved? Will the social reaction to your combination of linked concepts be favourable to you? Combine awareness meditation when dealing with this analysis. Concepts’ awareness (be they sensory or the product of your reasoning), their

decoupling, and their subsequent recombination, are the key steps in Implicative Truth Synthesis. Having a lone concept in your mind doesn't really mean too much until you put it in relationships with other concepts. “Floating” facts, experiences, or events in your mind are not worth much if you don't link them, or probe different connections, with other concepts. Then, for success in any discipline or project (from mathematics, engineering, to art, paintings, poetry), you put and examine your linked concepts in the all encompassing framework of human experiences, human and social values, things that matter to us.

7. Where Trial Meets Quantum Physics - Exploration of the Differences Between Two Inquiry Methods

When you look at the system in order to find out its axioms, you may discover that
there appears to be at least two, at first sight, diametrically different methods of research and inquiry: scientific method and debate or argument (discussion and rational argument.)

In our understanding of the physical world around us natural sciences hold a central place. They are generally related to physics and laws of motion. Using scientific method many questions in engineering, architecture, and physics can be answered by solving relevant Partial Differential Equations (PDEs). The initial and boundary conditions for these equations are the gates for creative input of an engineer, scientist, or an architect. Nikola Tesla and his invention of AC electric motor, Wright Brother's and their wing airfoil, or Zaha Hadid's architectural masterpieces are just a few examples for this.

Proofs that scientific method actually works are continuous discoveries in medicine and successful developments in disciplines such as organic and inorganic chemistry, biochemical engineering, nanotechnology, pharmacology, just to name a few.

We can say that the method of inquiry is scientific if it follows one or more of several definitions of the scientific method, for example, by the following sources:

“Scientific method - principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses” - from Merriam-Webster Dictionary.

“a method or procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypothesis" – from Oxford Online Dictionaries.

“a body of techniques for investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge. To be termed scientific, a method of inquiry is commonly based zn empirical or measurable evidence subject to specific principles of reasoning.” – from Wikipedia.

Now, where humanities and social sciences stand in relation to these definitions?

Some would argue that art is not scientific, that philosophy, jurisprudence, politics or other social sciences are not real sciences, but rather pseudo-sciences, because they are not put on the firm foundation of

mathematical formulae established from precisely structured, rigorous mathematical proofs or quantitatively explained by all-reaching physics laws using above defined scientific methods.

I want to explore another possibility and show that humanities and social, so called pseudo-sciences, including, for example, psychology, behavioural sciences, jurisprudence are based on the scientific method as well, even when the debate and argument are the part of the inquiry.

Most probably the main reason why there is this difference in views, and what might be a misunderstanding, is the confusion related to what is the focus of inquiry and what is the inquiry method itself. When people say “scientific inquiry” they mostly think of the domain of natural sciences, and how to explain the world around us through the classical and quantum physics and quantitative laws of motion. But, science is more a method of thinking than the domain of exploration. In case of natural sciences and mathematics, these two are too often put together; they are considered as an undivided unified whole, and whatever is outside that whole is non-scientific.

Hence, it might be futile to try to explain the social related phenomena with, or reduce to, physics’ laws of motion, even when these laws are called universal. For social sciences the subject and focus of inquiry and

research is our human experience, what matters to us, what we value, as opposed to the inquiry about the motion of a physical object, be it a quantum particle or stone rolling down the hill. Furthermore, if we talk about inquiry about human behaviour, physics laws uniformly support all kinds of human behaviour, good or bad, morally right or wrong. It is in our minds where our human nature determines what is right and what is wrong - and not by analysing space trajectory of some physical object. Since these are the concepts that reside only in our minds, they might be called subjective and hence truth elusive, but we, as humans often manage to overcome this perceived subjectivity and agree on certain things, no matter how difficult it can be. For instance, we try and often succeed to agree what is moral and what is not, what is ethical and what is not. So, there is a common ground in these matters, despite the perceived subjectivity. The Newton's laws are not describing these things and are not relevant at all here. The other kinds of laws, our human experience laws, are in question.

Although these laws appear to be so different than, say mathematics and physics, they are strongly based on logic. It is the kind of premises and the scope of subject matter that differentiate them from mathematics and physics laws. The fundamental reasoning and logic are the same.

Physics laws are closely linked to mathematics, and mathematics is quite specific how it obtains the truth and how to interpret events in our world. However, human action can have only one interpretation by the mathematical laws of physics, but can have hundreds of interpretations and meanings in the realm of humanities and social sciences and in our human experience. The truth, in these cases, can be obtained by different methods, some of which are debate and argument.

The kind of inquiry we use to solve our human experience related issues is not necessarily the quantitative oriented inquiry we use to solve mathematical problems. Moreover, mathematics is only one direction of thought, and should not be considered as the fundamental basis for all other reasoning directions.

But, one may further ask, in mathematics everything appears to be so precise - proofs are rock solid, truth is indisputable. Or, physics laws are proven to be true, therefore they are not up for debate or argument like, for instance, the establishment of guilt and punishment in a courtroom, where lawyers argue, during trials, what truth is and what is not. Or other research results in social sciences, based on “questionable” (by natural scientists) behavioural experiments and statistical methods. Hence, one may think that social laws and, for example, whole judiciary system, are based on subjective truth which can

change any time, which is “fluid,” and therefore the “truth discovery mechanism” is not scientific.

However, let’s contrast this with the method of proving mathematical theorems.

Sometimes it takes years to prove a theorem in mathematics. There is no formula to tell what will be the starting, winning point for your proof! This first premise, or first set of premises, with which you start your proof, is up for debate! Moreover, these initial premises can come not only from a debate or argument, but also from intuition, from trial and error, from previous experience, even from dreams, where our unconscious mind helps us to answer the pressing questions! Many science authors today agree that mathematics is more “fluid” than we think and that intuition and creativity are often more important than the rigour (although, at the end, we should strive to have a rigorous approach). As per the American mathematician Reuben Hersh, intuition plays a very important role in mathematical proofs. In accordance to him, creativity should be exercised before a rigorous approach takes place. Reuben Hersh emphasised that if we were so rigorous about mathematics we would never launch a rocket to the moon, because we will be tied up in long and tedious mathematical proofs.

The debate and argument are present in engineering as well. How would we otherwise name the

step of choosing initial and boundary conditions for partial differential equations? That's open to debate too! However, instead of debating, it's often called informed guessing, experimenting, or in more fancy terms, postulating, making hypothesis, or making conjectures.

The most prominent debates are the debates that emerge around issues that matter to us. While we can debate anything, only the issues that are pressing, that are urgent, are usually the desired subject of a debate. We often tend to choose "hot" issues impacting society right now- legalizing marijuana, LGBTQ community rights, religious rights, health, education, environment, military budgets, etc. Compare this with mathematics where any direction of thought and research can be chosen. There might be a practical usage of the obtained mathematical results where they can impact technology which in turn impacts society within a shorter period of time, but, also, there can be a body of mathematical work that does not see practical usage for years, decades, or even longer. Yet that mathematical research is conducted. We can note that mathematics and physics are not always about pressing matters.

Here is one example where debates connect with mathematics. For instance, one can say two plus two is four, no matter how we feel, no matter how much we argue, and it is not up for debate. That is true, but why did

you choose number two? The selection of that starting number may not come from the mathematical world at all. It can be a product of a debate and argument! And what would you do with number four. If you counted apples would you give four apples to a person who was hungrier, or less hungry? Would you give them to a mom with two children or to a mom with four children? What is the right thing to do? What is the moral and ethical thing to do? Newton's laws and mathematical theorems can't help here! Quantification usually cannot resolve the questions that enter this debate!

In any debate or argument, the postulates, assumptions are created on the fly; premises are outlined dynamically in the course of the debate, and the logical consequences of such assumptions, their truthfulness, are determined through discussion (the participants in a debate might agree with what is true and false to start with, and that will help the clarity and accuracy of their arguments.) This appears to be the most effective way available, under the given circumstances, to determine the truth.

Despite this, debating and arguing, especially in social sciences, are perceived to have "fluid" scientific approach. But, the goodness of inquiry method should not be judged only by an absolute, "rigid" list and predetermined sequence of steps in discovering truth from one class of disciplines, like natural sciences. A method

should be called scientific when it is the best logical method that can be applied under given circumstances. Because of that, debate and argument appears to be the best approaches in humanities and social sciences, for example in philosophy, politics and jurisprudence.

In a trial we cannot project thoughts and memories of a defendant or a witness onto the screen on the wall in order to get the absolute truth about actions and events in question. Instead, in a trial, we have arguments – opening and closing statements by prosecution and defence; witnesses will be called to testify under the oath and evidence will be presented along the way. Witnesses are cross-examined by prosecution and defence to determine their “credibility” and the truth, and to show the jury certain points of view. Evidence can be, ”clear and convincing” or not, explanations and interpretations of actions are “consistent” or “inconsistent” with some view. Compare this with the targeted rigour of a mathematical proof or accuracy and repeatability of a physics experiment! Yet, the trial process is the best that can be done under the given circumstances because of the complexity of human nature and human behaviour. This is the most rigorous approach we can devise, and the strictest logic we can come up with. Although not immediately noticeable, still, the trial process, itself, contains strong elements of logic. The premises are outlined along the trial, and the proofs

are constructed as best as possible, in due course. This resembles methods used for mathematical proofs. Because of human nature and enormous complexities coming from human behaviour, the verdict in a trial cannot be obtained by some simple quantitative formula. The guilt cannot be measured by a digital ruler or with some electrodes attached to the brain or using a fMRI (functional Magnetic Resonance Imaging); it has to be proved beyond reasonable doubt, which is the best possible measure under the circumstances. Guilt, justice, punishment exist in our minds, and not in physical objects or nature around us, and it is in our minds where these issues are resolved and not in a laboratory using a tape measure, laser, and voltage meters.

As physics laws can change with new research and science can advance in new directions, the trial court decisions can be overturned by appellate court. The opinion of the appellate judge will be compared with the opinion of the trial judge. While this comparison is not usually of quantitative nature, nevertheless the comparison is based on other merits and applicable logic, thus advancing the law in general and delivering the best possible form of justice under the circumstances.

Given these differences in the methods of inquiry and the domains of inquiry, is there a way to connect natural sciences, like physics, to social sciences, and say,

human behaviour, and with concepts that exist in our mind only, as oppose to physical objects around us? Yes! There is, in fact, a link between Partial Differential Equations (PDEs) and human behaviour. At the biochemical level, when we make a decision, or when genesis of a premise takes place, we specify initial and boundary conditions for PDEs that govern the electro-chemical processes in our neural system, causing neurons to fire signals to each other, causing neuron's ion channels to open and close, and neurotransmitters to flow in synapses that initiate receptors actions, which in turn result in our consequent actions: spoken word or a physical behaviour. At that moment of action, we exit the world of physics and enter the realm of human experience, the realm of what we value, what matters to us; and this experience exists only in our mind. In this realm, our innate sense for moral, ethics, law, aesthetics, things that matter take over.

This might answer the question why is jurisprudence necessary. Because of the mentioned chain of events, where bridging between quantum physics and human behaviour happens, we need lawyers and courtrooms to deal with results of chosen PDEs' initial and boundary condition that result in these human actions. Despite this courtrooms are not about proving some physics law. They are there to prove what initial conditions were chosen and postulated, for those partial differential

equations by individuals, reflected through their actions. However, instead of talking about neuroscience and directly about these initial conditions in quantum physics, lawyers talk about motivation and intent because the only realm we can see is human action taken and its consequences.

Hence, trial meets quantum physics at the moment lawyers start to argue the defendant's motivation and intent - which kind of initial conditions for his brain's biochemical reactions he or she chooses. And this is not directly measurable. It is reflected in the defendant's actions. If this can be directly measurable we would not need trial, lawyers, and jury. Because of that, counsels need to prove to the jury or to the judge, beyond reasonable doubt, that events happened in a certain way, driven by a certain motivation and intent. The measure here is "beyond a reasonable doubt" and not a reading from some digital scale. This is all done through argument.

How a crime relates to physics laws and to a scientific method?

When someone commits a crime, the crime certainly occurred in accordance to physics laws discovered by scientific method. The gun trigger was pulled in accordance to Newton's law of action and reaction. The combustion inside the cartridge occurred in accordance to strict laws of thermodynamics. The bullet

flew through the air in accordance to the laws of aerodynamics, and in accordance to the relevant partial differential equation that governs the bullet flight.

Then, when does an action, that happened in accordance to physics laws, become a crime?

Here are some definitions of crime:

"..an action or omission that constitutes an offence that may be prosecuted by the state and is punishable by law." Webster-Merriam Dictionary.

"..an action or an instance of negligence that is deemed injurious to the public welfare or morals or to the interests of the state and that is legally prohibited." – Dictionary.com.

The concepts like offence, law, negligence, morals, crime, guilt, innocence, justice, punishment exist in our minds and not in the physical objects around us, for which the physics laws apply. Again, all these concepts come from our human experience. The same physical action may be a crime under one set of circumstances, but not under another, or a physical action may not be a crime at all. As I mentioned, an action has only one interpretation under the laws of physics, but many more interpretations and meanings in the realm of social sciences, here specifically jurisprudence. While physics law explains a physical action, like pulling a trigger, it cannot answer the question of whether the action was right or wrong. These

physics laws will support any action, indiscriminately, be it right or wrong! It's up to us, humans, to use our minds to determine whether an action was a crime or not, was it right or wrong.

While the judicial system ideally should determine the truth, it deserves some criticism. As John Grisham wrote in his thriller "The Racketeer":

"The trial was a spectacle, a farce, a ridiculous way to search for the truth. But, as I learned, the truth was not important. Perhaps in another era, a trial was an exercise in the presentation of facts, the search for truth, and the finding of justice. Now a trial is a contest in which one side will win and the other side will lose. Each side expects the other side to bend the rules or to cheat, so neither side plays fair. The truth is lost in the melee. "

It is ironic that outside each courtroom there is a statue of a woman with closed eyes, weighing the scale, when the physics (that metaphorically represents objectivity) are rarely consulted in trials (except perhaps when an expert witness testifies), and jurors base their decisions, not with their eyes closed, but, among other things, based on actively observing, not only the facts, but the emotional and behavioural reactions of defendants, demeanour of lawyers and witnesses, thus allowing, consciously or unconsciously, their deliberation and verdict to be influenced by these.

Scientific methods that exist as a part of natural sciences, have a strong presence in the inquiries in social sciences and humanities as well. Because the underlying logic is the same while only domains of inquiry differ (for instance physics vs. jurisprudence), you don't need mathematics, as many educators would claim, to learn correct and powerful ways of reasoning. You can study law and still solve a problem in physics. Using the universal logic you discovered in one knowledge domain, you can choose different domain and use the same logic to continue research. This is, for instance, the central approach to cross-disciplinary projects that brings together natural sciences, humanities, engineering, and social sciences – like Artificial Intelligence, and many others.

8. Interpretation in Art

When connecting different systems, say engineering and art, via Premise Based Implicative Truth Synthesis, you might come to the question how to interpret a work of art. In order to answer that question let's look at this digital painting of a ship.

This painting is not about technical characteristics of the ship – it is not a user manual. Rather, the painting is about the evoked human values when looked at.

For instance, the position of the ship evokes a feeling of a *direction*, an intention to reach the goal of a journey. It can be also interpreted as a *determination*. The shapes of leading, front sails on the foremast (flying and outer jibs) with their precise shape pointing forward, evoke the feeling of *focus* - we are focused to move forward towards our goal. All the sails might evoke the feeling of

integrity and unity - our integrity with which we deal with the matters on our journey.

There should be no mystery in the interpretation of pictures or paintings by our "feelings", "emotions" or the sense of beauty. What is happening when we look at the painting of a sailing ship is that our a-priori evolutionary aesthetic (and other) circuits (mind faculties) are triggered into action by the painting and its symbols. Evolutionary psychology describes the nature of these circuits in detail.

Our a-priori evolutionary circuits recognize the meaning to the symbols in the painting. And this meaning will probably lend in the realm of the human values, in the realm of what is important to us, what matters to us. Then, once this main message is established in our mind, we begin to interpret relationships between the objects in the painting and even between its geometry elements (lines, shapes, surfaces), mapping those relationships to the relationships between the human values those elements represent.

While we can explore the neural mechanism behind these circuits using neuroscience (fMRI), for our philosophical inquiry more important thing is that they are starting points in our reasoning and experience – the *premise* part in the Premise Based Implicative Truth Synthesis method.